# The American Midland Naturalist

Founded by J. A. Nieuwland, C.S.C.

Editor
Joseph A. Tihen

ASSOCIATE EDITORS

Rollin H. Baker, East Lansing, Michigan.....Mammalogy
Leland Chandler, Lafayette, Indiana.....Entomology
Arthur Cronquist, Bronx, New York.....Systematic Botany
H. R. DeSelm, Knoxville, Tennessee.....Plant Ecology
Theodosius Dobzhansky, New York, N.Y.....Genetics and Cytology
David G. Frey, Bloomington, Indiana.....Limnology and Hydrobiology
Theodore T. Kozlowski, Madison, Wisconsin.....Plant Physiology
Monte Lloyd, Los Angeles, California.....Animal Ecology
W. Gardner Lynn, Washington, D.C.....Developmental Biology
George Willard Martin, Iowa City, Iowa.....Mycology
Michael Menaker, Austin, Texas.....Comparative Physiology
Raymond A. Paynter, Jr., Cambridge, Mass.....Ornithology
Robert W. Pennak, Boulder, Colorado.....Invertebrate Zoology
Edward C. Raney, Ithaca, New York.....Ichthyology
J. P. Scott, Bowling Green, Ohio.....Animal Behavior
Franklin Sogandares, New Orleans, Louisiana.....Parasitology
Donald W. Tinkle, Ann Arbor, Michigan.....Herpetology

Vol. 77, 1967
(January, April)

Dates of Publication
No. 1 — January 31, 1967
No. 2 — April 25, 1967

PUBLISHED BY THE UNIVERSITY OF NOTRE DAME
NOTRE DAME, INDIANA

## CONTENTS

### No. 1, January, 1967


Revision of Penstemon Section Habroanthus (Scrophulariaceae) I: Conspectus.....Frank S. Crosswhite 1

Revision of Penstemon Section Habroanthus (Scrophulariaceae) II: Series Speciosi.....Frank S. Crosswhite 12

Revision of Penstemon Section Habroanthus (Scrophulariaceae) III: Series Virgati.....Frank S. Crosswhite 28

The Leaf Dimorphism of Liquidambar styraciflua L.....Robert Ford Smith 42

Sympatry Changes and Hybridization Incidence in Mallards and Black Ducks.....Paul A. Johnsgard 51

Temperature Responses of the Periodical "17-year" Cicada, Magicicada cassini (Homoptera, Cicadidae).....James Edward Heath 64

Transpiration Resistance of Plants....Philip C. Miller and David M. Gates 77

Application of a Thermal Gradient Bar to the Study of Germination Patterns in Successional Herbs.....Richard H. Wagner 86

Etheostoma microlepidum, a New Percid Fish of the Subgenus Nothonotus from the Cumberland and Tennessee River Systems.....Edward C. Raney and Timothy Zorach 93

Effects of Dissolved Oxygen Concentration and Light Intensity on Activity Cycles of Fishes Inhabiting Warm Springs.....Clark Hubbs, Ronald C. Baird and Jerry W. Gerald 104

Plant Community Composition and Net Primary Production within a Native Eastern North Dakota Prairie.....E. B. Hadley and R. P. Buccos 116

Moisture Stress in a Vegetational Continuum in the Sonoran Desert.....Lionel G. Klikoff 128

Natural History Notes on Crotaphytus wislizeni (Reptilia: Iguanidae) in Colorado.....Clarence J. McCoy 138

Feeding Experiments with a Supposed Mimetic Complex in Salamanders.....Lowell P. Orr 147

Social Organization in the Mating Calls of Some Neotropical Anurans.....William E. Duellman 156

Effects of Dimethoate on Small Mammal Populations.....Gary W. Barrett and Rezneat M. Darnell 164

Food Habits of the Northern Pocket Gopher on Shortgrass Prairie.....Terry A. Vaughan 176

Helminths of the Robin, Turdus migratorius Ridgway, from Northern Colorado.....Robert L. Slater 190

Two New Genera of Stilbellaceous Fungi.....Everett F. Morris and David E. Finley 200

Notes on Clavarioid Fungi. VII. Redefinition of the Clavaria vernalis—C. mucida Complex.....Ronald H. Petersen 205

Notes and Discussion

Red-eye Mutation in Rhodnius prolixus (Hemiptera: Reduviidae).....Alfredo D'Ascoli and J. C. Gomez-Nuñez 222

Notes on Reptiles and Mammals from Southern Zacatecas.....Rollin H. Baker, Robert G. Webb and Peter Dalby 223

Fire Melanism among Mammals.....R. D. Guthrie 227

A Note on the Occurrence and Morphology of Panopistus pricei Sinitsin, 1931.....Harry L. Holloway, Jr., and Frank J. Etges 230

Some Effects of Deer Browsing on Chamise Sprouts After Fire.....John Davis 234

An Indiana Bat Impaled on Barbed Wire.....Anthony F. DeBlase and James B. Cope 238

Food of Siren intermedia nettingi in a Spring-fed Swamp in Southern Illinois.....Ronald Altig 239

Nesting Behavior of Tachytes (Tachyplena) praedator Fox, with a Review of the Biology of the Genus (Hymenoptera; Sphecidae: Larrinae)....C. S. Lin 241
Thyroid Morphology in Lizards of the Family Scincidae....W. Gardner Lynn and James Zmich 245
Thyroid Morphology in Lizards of the Families Anguidae, Chameleontidae, and Cordylidae....W. Gardner Lynn and Sister Mary Leonard Colorigh 247

Books Received .... 251

## CONTENTS

### No. 2, April, 1967

Physiological and Behavioral Aspects of Reproduction in the Brook Stickleback, Culaea inconstans....Howard M. Reisman and Tom J. Cade 257
Systematics of the Percid Fish, Etheostoma maculatum Kirtland, and Related Species of the Subgenus Nothonotus....Timothy Zorach and Edward C. Raney 296
A Comparison of the Life Histories of Coastal and Montane Populations of Ambystoma macrodactylum in California....James D. Anderson 323
Observations on the Life History, Ecology and Distribution of Desmognathus aeneus aeneus Brown and Bishop....Julian R. Harrison 356
Shrub and Herb Continua of Upland Forests of Northern New Jersey....Donald W. Davidson and Murray F. Buell 371
A Review of Social Behavior of the North American Cervids during the Reproductive Period....A. de Vos, P. Brokx and V. Geist 390
Ecology of Feral Goats in Haleakala National Park, Maui, Hawaii....Charles F. Yocom 418
Osteometric Variation and Function of the High-speed Wing of the Free-tailed Bat....Charles A. Long and Paul Kamensky 452
Ecology of Lizards in the Relictual Cape Flora, Baja California....Kenneth K. Asplund 462
Variation and Polymorphism in the Dorsal Color Pattern of Uta stansburiana stejnegeri....Royce E. Ballinger and Charles O. McKinney 476
Movements and Seasonal Activity Cycles of the Lizard Uta stansburiana stejnegeri....Peter D. Spoecker 484
The Ecology of Ammophila breviligulata. II. Genetic Change as a Factor in Population Decline on Stable Dunes....Charles C. Laing 495
32-Phosphorus Tracer Studies of a Horseweed-Aphid-Ant Food Chain....Armando A. de la Cruz and Richard G. Wiegert 501
A Preliminary Study of the Dietary Requirements of Tomocerus (Collembola)....Clifford B. Knight and Ruth Ann Angel 510
A New Crawfish of the Genus Orconectes from New Mexico (Decapoda, Astacidae)....Douglas B. Jester 518

Notes and Discussion
The Distribution of Kalmia latifolia L....Ernest A. Kurmes 525
Black Rat Snake Preys upon Gray Myotis and Winter Observations of Red Bats....David A. Easterla 527
Genetic Control of Bud Bursting in Altitudinally Diverse Cascade Forest Community Samples....S. J. McNaughton 528
Swarming Behavior of Mansonia perturbans (Walter)....Patrick H. Thompson 533
Behavior of Narceus americanus (Diplopoda) on Slopes and Its Ecological Significance....Robert V. O'Neill 535
Ectoparasites of a Mojave Desert Population of the Lizard Uta stansburiana stejnegeri Schmidt....Peter D. Spoecker 539

Books Received .... 543

## AUTHOR INDEX


Altig, Ronald ..... 239
Anderson, James D. ..... 323
Angel, Ruth Ann ..... 510
Asplund, Kenneth K. ..... 462

Baird, Ronald C. ..... 104
Baker, Rollin H. ..... 223
Ballinger, Royce E. ..... 476
Barrett, Gary W. ..... 164
Brokx, P. ..... 390
Buccos, R. P. ..... 116
Buell, Murray F. ..... 371

Cade, Tom J. ..... 257
Colorigh, Sister Mary Leonard..... 247
Cope, James B. ..... 238
Crosswhite, Frank S. .....1, 12, 28

Dalby, Peter ..... 223
Darnell, Rezneat M. ..... 164
D'Ascoli, Alfredo ..... 222
Davidson, Donald W. ..... 371
Davis, John ..... 234
DeBlase, Anthony F. ..... 238
de la Cruz, Armando A. ..... 501
de Vos, A. ..... 390
Duellman, William E. ..... 156

Easterla, David A. ..... 527
Etges, Frank J. ..... 230

Finley, David E. ..... 200

Gates, David M. ..... 77
Geist, V. ..... 390
Gerald, Jerry W. ..... 104
Gomez-Nuñez, J. C. ..... 222
Guthrie, R. D. ..... 227

Hadley, E. B. ..... 116
Harrison, Julian R. ..... 356
Heath, James Edward ..... 64
Holloway, Harry L., Jr. ..... 230
Hubbs, Clark ..... 104

Jester, Douglas B. ..... 518
Johnsgard, Paul A. ..... 51

Kamensky, Paul ..... 452
Klikoff, Lionel G. ..... 128
Knight, Clifford B. ..... 510
Kurmes, Ernest A. ..... 525

Laing, Charles C. ..... 495
Lin, C. S. ..... 241
Long, Charles A. ..... 452
Lynn, W. Gardner .....245, 247

McCoy, Clarence J. ..... 138
McKinney, Charles O. ..... 476
McNaughton, S. J. ..... 528
Miller, Philip C. ..... 77
Morris, Everett F. ..... 200

O'Neill, Robert V. ..... 535
Orr, Lowell P. ..... 147

Petersen, Ronald H. ..... 205

Raney, Edward C. .....93, 296
Reisman, Howard M. ..... 257

Slater, Robert L. ..... 190
Smith, Robert Ford ..... 42
Spoecker, Peter D. .....484, 539

Thompson, Patrick H. ..... 533

Vaughan, Terry A. ..... 176

Wagner, Richard H. ..... 86
Webb, Robert G. ..... 223
Wiegert, Richard G. ..... 501

Yocom, Charles F. ..... 418

Zmich, James ..... 245
Zorach, Timothy .....93, 296


## SUBJECT INDEX


Activity cycles, fish ..... 104
  reptiles .....141, 484
Adaptations, wings of bats ..... 459
*Ambystoma macrodactylum* ..... 323
*Ammophila breviligulata* ..... 495
Amphibians, food habits ..... 239
  life histories .....323, 356
  mating calls ..... 156
  mimicry in ..... 147
  neotropical ..... 156
Anguidae ..... 247
Ants, as consumers ..... 501
Aphids, in food chain ..... 501
Arachnida, parasitic, of reptiles.... 539

Baja California, lizards ..... 462
Bats, miscellaneous notes .....238, 527
  morphology ..... 452
  osteometric variation ..... 452
  predation on ..... 527
  wing function ..... 452
Behavior, amphibians .....156, 331
  fish .....104, 257
  insects .....64, 241, 533, 535
  mammals ..... 390
  reptiles .....141, 469
Birds, parasites of ..... 190
  sympatry and hybridization ..... 51
Browsing, effect after fire ..... 234
Bud-bursting, genetic control ..... 528

California, salamanders ..... 323
Calling behavior, amphibians ..... 156
Cervids, social behavior ..... 390
Chameleontidae ..... 247
Chamise, recovery after fire ..... 234
Chiggers, of lizards ..... 539
Cicadidae ..... 64
*Clavaria* ..... 205
Collembola, dietary requirements 510
Colorado, lizards ..... 138
  parasites of birds ..... 190
  pocket gophers ..... 176
Community composition, prairie .. 116

shrub and herb continua ..... 371
Conservation of parklands ..... 418
Cordylidae ..... 247
Crawfish, systematics ..... 518
*Crenichthys* ..... 104
*Crotaphytus wislizeni* ..... 138
Crustacea, life history ..... 523
morphology ..... 518
systematics ..... 518
*Culaea inconstans* ..... 257

Desert, lizards ..... 462
plants in ..... 128
*Desmognathus aeneus* ..... 356
**Dictyocatenulata,** n. gen. ..... 200
**D. alba,** n. sp. ..... 201
Dietary requirements, insects ..... 510
Dimethoate, effect on mammals .. 164
Dimorphism, leaves ..... 42
Ducks, hybridization ..... 51
Dunes, plants on ..... 495

Ecology, amphibians .....323, 356
insects ..... 241
mammals .....164, 418
plants .....371, 495
reptiles .....138, 462, 484
*Etheostoma maculatum* ..... 296
**E. microlepidum,** n. sp. ..... 94

Feeding experiments, on
salamanders ..... 147
with pocket gophers ..... 184
Feral goats, in parklands ..... 418
Fire, recovery from, plants ..... 234
related to melanism ..... 227
Fish, activity cycles ..... 104
behavior .....104, 257
distribution .....103, 312
morphology .....93, 301
physiology and reproduction .... 257
systematics and
phylogeny .....93, 289, 296
Food chain, tracer study ..... 501
Food habits, amphibians ..... 239
mammals ..... 176
reptiles .....145, 467
Fungi, in diet of Collembola ..... 510
morphology and
systematics .....200, 205
phylogeny ..... 219

Geographical distribution, birds.... 51
fish .....103, 312
fungi ..... 205
helminths .....193, 230
mammals ..... 223
plants .....12, 28, 525
reptiles .....223, 462
Germination patterns ..... 86
Growth and development,
amphibians .....336, 358
plants, after fire ..... 234
reptiles ..... 141

Habitant preferences, reptiles .... 462
**Habroanthus,** subgen. nov. ..... 5
*Habroanthus* (Section) .....1, 12, 28
Hawaii, feral goats in ..... 480
Helminths, host and geographical
records .....190, 230
morphology ..... 230
of birds ..... 190
Hemiptera, mutation in ..... 222
Home range and homing, reptiles 484
Horseweed, in food chain ..... 501
Host records, of helminths ..190, 230
**Hyalotrochophora,** n. gen. ..... 202
Hybridization, birds ..... 51
plants ..... 8
Hymenoptera, ecology ..... 241

Illinois, salamanders ..... 139
Insecticides, effect on mammals .. 164
Insects, behavior .....64, 241, 533
dietary requirements ..... 510
ecology .....241, 501, 535
in food chain ..... 501
mutation in ..... 222
reaction to moisture gradient
and slope ..... 535
temperature response ..... 64

*Kalmia latifolia,* distribution ..... 525

Leaf dimorphism ..... 42
Life history, amphibians .....323, 356
crawfish ..... 523
Light intensity, effect on fish
activity ..... 104
*Liquidambar styraciflua* ..... 42
Lizards, color pattern
polymorphism ..... 476
morphology .....245, 247
natural history .....138, 462
reproduction ..... 465

*Magicicada cassini* ..... 64
Mammals, behavior ..... 390
distribution ..... 223
ecology ..... 418
food habits ..... 176
insecticides, effect on
populations ..... 164
management ..... 418
melanism ..... 227
miscellaneous observations ..... 238
morphology ..... 452
osteometric variation ..... 452
parasites of ..... 230
reproduction ..... 390
Management, of feral goats ..... 418
*Mansonia perturbans,* swarming.. 533
Mating calls, amphibians ..... 156
Melanism ..... 227
Mimicry ..... 147
Moisture gradient, insect
reaction to ..... 535
Moisture stress, desert plants ..... 128

## SUBJECT INDEX


Morphology, fish ..... 93, 301
fungi ..... 200, 205
helminths ..... 230
mammals ..... 452
plants ..... 42
reptiles ..... 245, 247
Mortality, bat, due to barbed wire 238
Movements, reptiles ..... 484
**Multiclavula,** n. gen. ..... 207
**M. sharpii,** n. sp. ..... 216
Mutation, in *Rhodnius* ..... 222
*Narceus americanus* ..... 535
Natural history, mammals ..... 527
reptiles ..... 138, 462
Neotropical amphibians ..... 156
Nesting behavior, fish ..... 287
insects ..... 241
New Jersey, vegetation ..... 371
North Dakota, plant communities 116
*Nothonotus* (subgenus) ..... 93
**Orconectes causeyi,** n. sp. ..... 518
Osteometric variation ..... 452
Oxygen concentration and fish activity ..... 104
*Panopistus pricei* ..... 230
Parasites, host records ..... 190, 230
of birds ..... 190
of mammals ..... 230
of reptiles, external ..... 539
wasps as ..... 241
*Penstemon* ..... 1, 12, 28
**P. deaveri,** nom. nov. ..... 38
**P. virgatus pseudoputus,** n. subsp. ..... 35
*P. virgatus putus,* n. status ..... 34
Phenology, leaves ..... 42
related to moisture stress ..... 134
Phosphorus-32 ..... 501
Photoperiod, influence on fish .... 257
Phylogeny, fish ..... 289
fungi ..... 219
Physiology, fish ..... 257
plants ..... 77
*Plantago,* germination patterns .... 86
Plants, bud bursting ..... 528
community composition .... 116, 371
desert ..... 128
distribution ..... 12, 28, 525
ecology ..... 495, 528
germination ..... 86
hybridization ..... 8
moisture stress ..... 128
morphology and phenology ..... 42, 128, 528
physiology ..... 77
productivity in prairie ..... 116
recovery after fire ..... 234
systematics ..... 1, 12, 28
Polymorphism, reptiles ..... 476
Populations, feral goats ..... 418
small mammals ..... 164
Prairie, plant communities ..... 116
pocket gopher in ..... 176
Predation, by reptiles ..... 527
on bats ..... 527
on salamanders ..... 148
Productivity, prairie plants ..... 116
Radioisotopes, tracer studies ..... 501
Red-eye mutation ..... 222
Reduviidae, mutation in ..... 222
Reproduction, amphibians ..... 328
fish ..... 257
mammals ..... 390
reptiles ..... 145, 465
Reptiles, activity cycles ..... 484
as predators ..... 527
color pattern polymorphism .... 476
distribution ..... 223, 462
ectoparasites of ..... 539
home range and movements .... 484
morphology ..... 245, 247
natural history ..... 138, 462
*Rhodnius prolixus* ..... 222
Salamanders, food habits ..... 239
life history ..... 323
mimicry in ..... 147
Scincidae ..... 245
Scrophulariaceae ..... 1, 12, 28
*Siren intermedia* ..... 239
Slopes, reaction to by insects ..... 535
Social behavior, mammals .... 398, 438
Social organization, amphibian mating calls ..... 156
mammals ..... 391
Sonoran Desert, plants ..... 128
*Speciosi* (Series) ..... 6, 12
Stilbellaceae ..... 200
**Stricti,** series nov. ..... 6
Swarming behavior, insects ..... 533
Sympatry and hybridization, birds 51
Systematics, fish ..... 93, 296
fungi ..... 200, 205
plants ..... 1, 12, 28
*Tachytes praedator* ..... 241
Territorial behavior, fish ..... 273
*Thomomys talpoides* ..... 176
Temperature responses, cicadas .. 64
fish ..... 257
germination of plants ..... 86
Thermal gradient bar ..... 86
Thermoregulatory behavior, insects ..... 64
Thyroid morphology, lizards 245, 247
*Tomocerus,* dietary requirements 510
Transpiration resistance ..... 77
*Turdus migratorius* ..... 190
*Uta stansburiana* ..... 476, 484, 539
Variation, color pattern, reptiles.. 476
osteometric, mammals ..... 452
Vegetation, prairie ..... 116
Vegetational continuum ..... 128, 371
**Virgati,** series nov. ..... 6
systematics and distribution .... 28
Zacatecas, mammals and reptiles.. 223